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ABSTRACT

This survey of faculty attitudes toward technology calls for more critical dialogue on the uses, effects and hidden costs of information technology in the classroom and the national political economy. A survey was administered to 250 faculty members (135 were returned) at a northeastern university. The comments of respondents fell into two main areas of concern related to the use of information technologies in education. Most dramatically, instructors worried about the devastation of the teaching profession and, with it, the loss of their own jobs. Second, many were anxious about the dehumanization and alienation their students might face in a computer-dominated learning environment and workplace. Much of the expressed anxiety centered on the notion of distance learning. A few respondents said they had no objections to the potential uses of technology in education, but had not explored these personally because of limited resources and time. Others expressed eagerness to do whatever would be expected of them when the new technologies appeared on campus, while some said technology would be impossible to use in their particular disciplines. Many, including elite technology users, said they doubted students were being "educated" simply by using computers, and a few were cynical about the claims that mastery of computer skills in college would enable their students to find high-paying jobs after graduation. Contains 22 references. (AEF)

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Do professors dream of electronic students?

Faculty anxiety and the new information technologies

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ABSTRACT

Having automated other professions, computer technologies are now seen as a means of downsizing higher education. This survey of faculty at a northeastern university calls for more critical dialogue on the uses, effects and hidden costs of information technology in the classroom and the national political economy.

Introduction: The theoretical turns personal

The brave new world of computer-mediated information flow is proving to be a rich source of inspiration to great numbers of observers and scholars. Some consider the economic impact of the phenomenon, while others seek to interpret its social outcomes, envisioning empowerment or enslavement. Somewhere between utopian hype, reasoned discourse, and prognostications of doom, a number of academicians are feeling uneasy, as the computer, having automated so many other tasks and professions, begins to dominate their workplaces as well, and threatens to define their worth. Will computers replace educators, too?, we wonder, tossing uneasily in our sleep.

To some, these nightmares may seem fanciful and backward. After all, information technologies have been in use for decades in higher education. At research universities with lavish resources, conveniences such as powerful mainframes, faculty personal computers, well-equipped networked student labs, electronic databases, and e-mail and Internet access, have been commonplace for some time. Students and faculty routinely take advantage of such technologies, regarding them as tools useful in the performance of academic writing, research, and discourse. Where such hardware and software are plentiful and accessible, the sudden "discovery" of new communication technology by administrators does not drive the educational enterprise - though critics say that such de facto control has been in place at major universities for so long that it is simply taken for granted.

But at smaller, poorer institutions of higher learning, where historically resources and access to communication technologies have been limited, the new cultural climate is one of upheaval. In these environments, the word *technology* itself is being repeated like a mantra, packed with associations of modernity and progress. In these resource-poor environments, information is seen as "an unmixed blessing, which through its continued and uncontrolled production and dissemination offers increased freedom, creativity, and peace of mind" (N. Postman, 1995, p. 71). Computers have become status markers, and

their masters the new knowledge elites. Almost any proposal or research scheme involving technology is considered "cutting edge." Administrators, lured by the scent of corporate funding (R. McChesney, 1996), urge the incorporation of computer technology into coursework wholesale, no matter the subject or appropriateness. Students must be made "competitive" with computer skills (Neill, 1995). Faculty must be "retro-fitted," and their attitudes and practices adapted to technology (Rutherford & Grana, 1995). Administrators envision the linking of masses of eager learners and a few select master teachers via satellite (Boucher, 1994). Technology is seen as a panacea, a miraculous cure for scarce resources, brutal budget cutbacks, and even long-term fiscal mismanagement.

This paper takes a closer look at one such institution, a small branch campus of a state university in the northeastern United States, where faculty display varying levels of technological involvement and sophistication. Some professors regularly conduct complicated data analyses or design their own Web pages, and increasing numbers routinely use computers for lecture notes, tests, research, and e-mail. Others still do not own or use computers at all; some of these presently claim a great interest in doing so in the future, motivated perhaps by their institutions' indiscriminate enthusiasm for all things virtual. But what these users and non-users alike share is the apprehension that new developments in information and communication technologies may displace them from their livelihoods.

In this regard, the attitudes of faculty at resource-poor universities may have more in common with those of the general population than they do with those of information "elites" at wealthier institutions. As the institutional clamor for technology grows louder around them, some individual faculty members are making connections between the downsizing of the economy, the push to computerize, and their own previously secure employment. Academics are beginning to ask the same kinds of questions that workers in other professions have been asking for quite a while. What kind of brave new world is coming into being through computer mediated communication, and what are the hidden

costs of these new technologies? Will these new tools dehumanize us, substituting the glow of the monitor for the familiar faces of our students and colleagues? Will computers wind up eliminating our jobs and devaluing our research? In short, are we, too, about to be made obsolete?

This paper explores the posing of such questions through the analysis of qualitative data gathered from a small survey of faculty at a state university. Although one respondent complained that university faculty and administrators displayed "an almost pathological avoidance of critical and foundational reflections on these matters," the data gathered here suggest otherwise, representing the candid, personal, sometimes eloquent responses of a small sample of educators to the impact of new technologies upon their daily routines. My discussion of these data is informed by several strands of contemporary discourse on the potential sociopolitical and educational impacts of information technologies, which I synthesize in an effort to make meaning of the pervasive anxiety generated by the most recent wave of technological development in a late capitalist economy.

The concerns discussed in this paper are not the *exclusive* domain of communication scholars, but they have special salience for us. We are the educators who teach others how to use communication media, and how to create and disseminate messages through them. We are the scholars who interpret and make sense of the economic and social impacts of innovations in information technology. We are the consultants expected to offer guidance to policy makers and regulators. Yet ironically, as McChesney (1996) notes, we find ourselves among the imperiled: "It is a paradox that precisely at the historic moment that communication is roundly deemed as central to global political economy and culture, those academic departments expressly committed to communication research are facing severe cutbacks or even elimination" (p. 119).

Therefore, this paper treats the communication of anxiety about information technology as a communication problem. Communication studies becomes critical, Rosen

(1994) asserts, "when, in the company of others, it fashions a 'we' language that speaks to common values, common problems, a common heritage, a common sense of the historical moment and its possibilities" (p. 369). It is my hope that this paper will contribute to a stronger critical dialogue about the application of information technologies in education and contemporary society.

Review of the literature

As a nation we have been historically inclined to find extraordinary promise in the introduction of new technologies, from radio to the film strip. J. Pavlik (1996) reviews the resultant debate over the social and cultural consequences of such developments, noting that it has followed a predictable pattern. Advocates tend to argue that technological change stimulates positive reform in social institutions, brings expertise and aid to people in remote locations, and fosters democratic participation. Critics have associated technology with "a variety of social and cultural evils, including the loss of human employment, environmental damage, and increased control over information" (Pavlik, 1996, p. 305).

This debate now focuses on the computer, the darling of the current age. Enthusiasts are particularly excited about the proliferating new forms of computer mediated and interactive communication, especially e-mail, Usenet and the Internet. Boucher (1994) asserts that the "information superhighway" is "a development in technology so remarkable in scope that it could equal the telephone or the steam engine in its ability to reorder our economy and improve our quality of life" (p. 16) The rise of electronically linked "virtual communities" which engage large numbers of people in the electronically mediated sharing of common interests (as discussed by J. Meyrowitz, 1985; Parks & Floyd, 1996; G. Payne, 1993; H. Rheingold, 1993; M. Smith, 1995; S. Turkle, 1996; and others), has generated much discussion about a renewal of hope for political democracy and civic involvement. And McChesney's survey of the literature

tracking the computer's central role in transforming global markets (1996) finds an intoxicating vision of "capitalism at its best." He notes that the images contain "no cheap, exploited laborers; no environmental degradation; no graft or corruption; no ingrained classes; no economic depressions; no instances of social decay; and no consumer rip-offs. There are bold, open-minded winners and hardly any losers" (p. 109). In contemporary U.S. society, J. Steffens (1994) observes, innumerable praise singers are declaiming the important role of communication technologies "in building a bountiful, equitable, and more fulfilling world in which to live" (p. 13).

At the same time, a growing number of critics of the new "information age" are being heard. These theorists (including J. Ellul, 1964; W. Griffen, 1995; M. Neill, 1995; N. Postman, 1995; T. Roszak, 1994; K. Sale, 1995; and C. Stoll, 1995) contend that the latest developments in information technology are not benign or neutral, as advocates assert. Instead, they represent the imposition of an exploitive value system which is reshaping society in potentially oppressive ways. Far from being a democratizing force, Griffen (1995) asserts, computers and information technologies (CIT) are "harnessed to an economic system whose growth and concentration of wealth patterns are increasing . . . so long as present power arrangements prevail, information for growth, profit and control will be the primary use of CIT" (p. 2). Roszak (1994) points to the passivity and despair generated as increasing numbers of people come to believe the commercially motivated claims of the computer science industry that the human mind is obsolete:

> Already there may be a large public that believes it not only cannot make judgments about computers, but has no *right* to do so because computers are superior to its own intelligence - a position of absolute deference which human beings have never assumed with respect to any technology of the past. (p. 45)

The notion of the computer as the locus of supreme intelligence is leading to the "deification of technology" (Postman, 1995), the "cult of information" (Roszak, 1994). New standards of intelligence are evolving, where knowledge is defined as that which can

be processed by the computer. Postman (1995) reads a growing sense of disorientation generated by the boundless information flow now waiting at the touch of a key:

> From millions of sources all over the globe, through every possible channel and medium - light waves, airwaves, ticker tapes, computer banks, telephone wires, television cables, satellites, printing presses - information pours in. Behind it, every imaginableform of storage - on paper, on video and audio tape, on discs, film, and silicon chips - is an ever greater volume of information waiting to be retrieved . . . Information appears indiscriminately, directed at no one in particular, in enormous volume and at high speeds, and disconnected from theory, meaning, or purpose (pp. 69-70).

As the computer is accorded a more and more authoritative role in society, the uncertainty and unpredictability of its intricate systems creates a "persistent feeling of disquiet, edging toward fear" (Sale, 1995, p. 239). The new information technologies "seem to be beyond anyone's control, operating at such speed and complexity that it defies human competence to manage them regularly and infallibly" (p. 211). As contemporary society increasingly seeks its validation in technology and finds its satisfactions in technology (Postman, 1995, p. 71), the deity of the new age is already beginning to exact a psychic price.

While proponents say the computer is revolutionizing the nature of work and generating a previously unimaginablearray of new jobs (such as Negroponte's "seamless digitial workplace" of global software producers [1995, p. 228]), critics fear that the techno-deity will demand a punishing economic sacrifice from contemporary society. "Whatever its presumed benefits of speed or ease or power or wealth, industrial technology comes at a price, and in the contemporary world that price is ever rising and ever threatening" (Sale, 1995b, p. 785). Sale sees the computer as only the latest step in a pattern of industrial exploitation based on the routinization and deskilling of labor:

> Massification and quantification . . . were probably the reason computers became so important in the first place, as necessary adjuncts to a mass society and its mass production, mass marketing, mass consumption, mass communications, mass education, and mass culture. Add to these such other attributes of high

> technology as centralization, order, speed, uniformity, regularity, linearity, and passivity, and it becomes clear that when a civilization buys into the computer's logic it buys much else besides. (1995a, p. 210)

In the United States, he argues, most of the new employment created in the last decade has been in the form of part-time and temporary "disposable" jobs characterized by lower wages, reduced benefits, fewer hours, and no security - jobs which are "there when employers need them and gone as soon as computerization or a sales downturn makes them unnecessary" (1995a, p. 227).

Economists are predicting the mechanization of millions more service, data processing, manufacturing, office, and other jobs; "data-entry, monitoring, and limited problem-solving will continue to comprise most computer use by the great majority of employees in the U.S." (Neill, 1995, p. 188). Market investment in "information age" technology is as likely to destroy existing jobs as create new ones, McChesney (1996) attests, and the new industries seem incapable of resolving the crisis of unemployment affecting the working class. Even Negroponte (1995), a self-described technoptimist, predicts "the loss of many jobs to wholly automated systems . . . the notion of lifetime employment at one job has already started to disappear" (p. 227).

Yet, paradoxically, the most utopian discussions of technology's role in society focus on the preparation of young people to enter the marketplace. Technology advocates insist that today's youth must be trained on computers from childhood in order to become "highly skilled, highly paid workers in the economy of the future" (Neill, 1995). This line of reasoning, aided by the public's uncritical response and the eagerness of the computer industry to open up new outlets for its wares and services, has led to the introduction of personal computers, and the desire for more of them, in primary, secondary, and post-secondary classrooms across the nation.

The pressure to adopt technology in education is not new. Since World War II, E. W. Gormly (1995) observes, assorted mechanisms "have been touted as change agents that would reduce student dependency on teachers and offer an economical, mass

approach to teaching" (p. 1). The personal computer is but the latest of these innovations. Making the same "stream of exaggerated claims" as the advocates of paperback books, film strips, radio and television did in decades past, today's adherents of the information age see the computer as "the perfect tool for carrying out the basic principles in instructional method" (p. 10). What the technophiles overlook, Gormly asserts, is the fact that relatively few of the technological developments introduced in the last 50 years have become widely affordable and useful in education.

Instead, the increasing numbers of school systems and universities which look to computer technology to solve their fiscal problems are urging their educators to "get with the program" and boot up immediately. Those who achieve mastery in technology use become "an elite group that are granted undeserved authority and prestige" (Postman, 1995, p. 9) by those who do not. The practices of the traditional classroom - thinking and problem-solving, speaking and writing, group discussion and lecture, and so on - are being massively redefined in terms of what computers can do (Neill, 1995; Postman, 1995; Roszak, 1994). The fever is endemic, Roszak (1994) comments: "One would be hard-pressed to find another time when a single industry was able to intrude its interests so aggressively upon the schools of the nation - and to find such enthusiastic receptivity (or timid surrender) on the part of educators" (p. 60). Indeed, the rosy future Boucher (1994) envisions, wherein "students in every corner of the nation could have equal electronic access to new courses, the best teachers, and the widest selection of information" (p. 16), is made to seem possible only through the universal adoption of the latest information technologies in the classroom.

As government, industry and civic leaders have increasingly adopted the rhetoric of a new networked world of unlimited information access, funding for public education (and public libraries) has become harder to obtain, and the demands of corporate employers seeking a trained work force have come to carry greater weight with education administrators. To meet these demands in the new information age, Rutherford & Grana

(1995) warn, "faculty will have to renovate attitudes, refurbish frayed pedagogy, and rewire old circuits to accommodate all of these technologically inspired changes" (p. 83). Administrative rhetoric has begun to carry the implicit suggestion that those who cannot or do not wish to be "retro-fitted" had better find another line of work. While professionals in many fields are being urged to jump on the "information superhighway," educators are facing enormous pressures to do so.

Method

In the mid-1990s, a well-respected state university system in the northeastern United States found itself beset by political and financial woes. After the latest round of cutbacks and increasingly dire economic predictions, branch campuses of the university suddenly received word that, at an unspecified future date, a limited amount of state funding might be made available on a competitive basis for capital projects and new technologies. In eager response, administrators at several campuses set up planning committees to gather data and make recommendations for funding requests.

The author of this paper served as a member of one of these committees, on one branch campus. In November 1995, my committee was asked to survey all 250 full-time faculty about current and anticipated future uses of information technologies, including computer labs, "smart classrooms," distance learning, local access networks, the Internet, etc. We intended to use the survey data to predict future needs for information technologies on our campus. Because of the pervasive institutional climate of budget cutbacks and a perceived sense of "use technology or die," the committee agreed that responses to the survey should remain completely anonymous, to limit overinflated reports of use or self-justifying predictions of anticipated use.

Because I was interested in the appropriate use of new technologies in education, I suggested that the research instrument also provide a space for qualitative reflection and the expression of faculty concerns or questions related to technology use. The committee

reluctantly agreed, though several members strenuously objected, saying that we were charged to identify uses, not concerns. One member even predicted that those faculty members who were resistant to technology use would no longer be working at this institution by the time funding for technological development became available. When the survey was administered in November 1995, it contained 28 multiple-choice questions regarding the frequency of use of labs, computer-based instruction, projection of text and graphics, etc. At the end, it asked a single open-ended statement of implied question: "If you have concerns about the use of computer technology in education, we would be interested in knowing the nature of your concerns."

Of the 250 surveys disseminated, 135 were returned. Twenty-nine, or 21.5 percent, of the anonymous responses included written answers to the "concerns" question. Some of these were terse, one-paragraph statements, while others included several pages of typewritten addenda. Most explored several topics. Some of these concerns were expressed by non-users of technology, but many came from faculty who said they currently used computers for writing and research, and some came from instructors applying technologies in the classroom as well. From their comments, a few faculty members appeared to be extremely well-informed on issues of technology and higher learning (an education professor included a conference paper he had presented on the subject). Many more appeared unacquainted with the literature, and seemed to be considering these issues in relation to themselves for the first time.

The information gathered in this study was constrained by the entirely voluntary and anonymous nature of the survey. Gender, race, age, academic rank and discipline of faculty members in this small, self-selected sample were unknown, except in a few cases where respondents identified themselves by teaching area or department. Therefore it was not possible to ask follow-up questions or to interview individual speakers from this sample in more depth. However, it was the opinion of the research committee that anonymity played a significant role in allowing us to collect the data in the first place.

Findings

The survey responses quoted here offer us a closer look at perceptions of these pressures at the university level. The comments of professors who responded to the survey expressed two main areas of concern related to the use of information technologies in education. First, they worried about the devaluation of the teaching profession and, with it, the loss of their own jobs. These professionals, including many experienced users of computer technologies, expressed concern about the depreciation of their teaching by administrators and state leaders. A number of non-users also seemed to internalize the promotional hype about computers and diminish the worth of their own non-technological teaching approaches. These pledged their enthusiasm and vowed to adapt their courses to information technology as soon as the installation of wiring or purchases of hardware, software, or modems made this possible.

Second, many respondents were anxious about the dehumanization and alienation their students might face in a computer-dominated learning environment and workplace. These professors worried about the potential effects if educators were forced to rely on computer technology to teach larger numbers of students, and personal contact with students was reduced. They expressed unease about both those types of pedagogical interactions which the computer might facilitate (as in the case of distance learning) and those it might obliterate (such as group and one-on-one personal interaction). Some worried about the economic and political fates of their students, who they feared would graduate without social or critical thinking skills into a competitive, mechanized computer society lacking in employment opportunities or democratic participation.

Most dramatically, the comments collected in the survey resonated with faculty members' fears for their own jobs. In an environment plagued by numerous budget crises, even expert technology users did not trust their skills to preserve their positions. Many felt the need to emphasize to would-be planners that the value of technology lay in its use

by human educators, not as a substitute for them. One professor wrote, "I am concerned that instruction that uses technology will be seen as better *regardless* of how the technology is used, and I don't think this is so." A regular technology user pointed out that the use of computers as educational tools costs as much or more than conventional instruction and is more time-intensive for instructors than conventional instruction, "but I am not sure the policy makers understand this." Another said:

> As a scholar and teacher, I use e-mail to communicate with others in my field, word processing to write lectures, articles, book manuscripts, and to keep track of grading; and I use the information resources of on-line catalogue and the like to access libraries. I encourage students to do the same. I do *not* think that greater investment in technology hardware and software can replace or approximate personnel losses through faculty and staff layoffs.

Many professors clearly interpreted the administration's discussion of increased use of technology to portend a decrease in the use of human personnel. One commented, "I fear 'economics' may drive using technology to teach great numbers of students, with fewer faculty doing personal instruction." One noted that technology should be "a supplement, not substitute for instruction, but I very much doubt that this is the objective of the bean-counters in (state government)." A professor wrote that "Machines have historically been used to increase profits by cutting the labor force. Computers in higher education will probably have a similar effect." And finally, one instructor (who may have been one of the faculty members whose contracts were not renewed that year) looked back over his or her answers and remarked at the end, "I have responded to this survey the way I would *if* I were going to be around - how long that will be, nobody knows. . ."

Much of the expressed anxiety centered on the notion of "distance learning," a form of mediated instruction which had won the favor of university administrators and state officials, who never clearly defined how they envisioned the use of the technology, but often mentioned it during budget discussions as a means of "reducing costs." In the

survey, some faculty critiqued its effectiveness as a pedagogical approach; one instructor called it a "fast-food" approach to teaching, and another said the term sounded like "a euphemism for 'correspondence school' (which) will lead just as easily to a decline in the quality of education as an improvement." But most saw "distance learning" as another term for downsizing. "Distance learning will lead to real people losing their jobs, and speed-up for those who are left," one wrote. Said another, "I'm very leery of distance learning, since it seems to be suggested in order to solve budget problems."

A few respondents said that they had no objections to the potential uses of information technology in educational instruction, but had not explored these personally because of limited resources and time. "There is a limit to how much time I am willing to devote to these technologies," one wrote. Another said, "It is very difficult to respond to this survey since I have no knowledge base. I don't know the possibilities." A third commented wryly that university faculty had had little access to information technologies in the past and therefore had no way to anticipate using them in the future. "It's like asking a tribe in the depths of the Amazon what kind of telephone service they would like. We are so far behind on basic access and training, that planning is problematic."

Others, perhaps more insecure about holding on to their jobs in the approaching new information order, expressed their eagerness to do whatever would be expected of them when the new technologies appeared on campus. "I've always been interested in technological innovation and how I can use it," one asserted. Several insisted they were eager to use technology in their classrooms but had been unable to so far because of the institution's limited facilities: "I want to, but I can't, because [this institution] isn't set up for me to use it!," wrote one faculty member. Another professor noted that her office, or his, did not contain a computer. "If it was there, I would use it. Since it's not there, I can't. . . I *want* to use it." A colleague wrote, "I don't feel I know enough about various technologies, but I would *like* to learn more/use more." And another faculty member said,

"I need the time, training and equipment to develop method to adapt my teaching for this. I am willing and have started."

Although many respondents were concerned for themselves, a large number also seemed genuinely apprehensive about the effects technologically-assisted instruction might have on their students. Some said they were afraid that computers would dehumanize the college experience for students by eliminating personal interaction between students and faculty. "I believe that students will suffer when students have no direct contact with the teacher," a professor wrote. Another noted that "some aspects of instruction and learning are social and should not be eliminated." One professor asked, "Will quality of teacher/student and student/student interaction suffer?" Another emphasized that education "still relies upon the motivation of instructors and students, and the quality of their interaction." A third commented that the application of technology in education should not "ignore what we know about the benefits of small classes and *increased* interaction with instructors. Contact with students over distance and outside of class times can enhance a student's learning, but not if it becomes an excuse to distance teacher-student relationships."

Some instructors said technology would be impossible to use in their particular disciplines. For example, a person who identified herself or himself as a history professor (but did not indicate gender!) noted:

> No computer, however powerful and sophisticated its software may be, is ever going to surpass a human being in making someone a competent student of history. Learning history (and understanding its significance) comes down fundamentally to reading, thinking, discussing and writing - no computers needed there; just a book, a willing and capable mind, and an informed, patient instructor will do the trick. This formula is simple, and has worked for *centuries* (with modifications, of course). Why mess with it?

And an art professor worried about the logic of using computers to teach the visual arts. "If a student learns via computer, will they be reliant on that equipment to 'solve'

problems, and is that sufficient for the next generation of graphic artists?," he or she wrote.

Many, including elite technology users, said they doubted students were being "educated" simply by using computers, whether for research, writing or data analysis. One professor wrote:

> While I have had very good experiences using computers to facilitate communication among students and between students and myself, I see no evidence (at all!) to support the idea that student learning is occurring in this environment. I believe much research needs to be done on just what *learning* occurs in such an environment, which students learn best (if at all), and how such learning is "different" from traditional pedagogical techniques.

Another worried "that the computer may create users rather than producers and. . . may perform functions on its own which students will stop developing (as the calculator replaces an understanding of arithmetic)." One fretted that some educators would "mistake the technology for the subject" and accept technical competence as proof of intellectual development. "We should give credit for writing, not for learning how to use WordPerfect," the writer noted. "We don't give students academic credit for penmanship, so we shouldn't give them credit for the technological equivalent." Some argued that computer-assisted pedagogy might even be disempowering. Rather than challenging the authoritarian model of traditional teaching, she or he noted, technology-based instruction recreates it. In a lab or "smart classroom," a respondent wrote, "the student is essentially passive and the lecturer literally 'pours' knowledge into the student . . . Then the student spits back the information, and we claim that knowledge has 'changed' the student in some way."

Finally, a few respondents were cynical about the utopian claims that mastery of computer skills in college would enable their students to find high-paying jobs after graduation. One wrote:

> Whose needs are met by this technology? Jobs are automated and merged out of existence, real wages decline, jobs are moved overseas and we are asked to cooperate with those who created and profit from the crisis. Why should we be adapting to and reproducing an economic system that is destroying the public sector?

Another professor wrote that the sudden application of computer technologies in so many disciplines within higher education would "create in our students a false expectation of jobs that do not currently exist in the state's economy." Finally, one summed up in frustration, "Unless the fundamental premises about society, technology, education and pedagogy are challenged and radically altered, *nothing* we do in the area of computer technology will matter."

Conclusion: In higher learning, the future isn't what it used to be

Although the survey presented here accounts for only the tiniest slice of the population of academics in one region in the country, the comments of the participants suggest that the expansion of the information economy is a cause for deep concern, in higher education as elsewhere. As the evidence here indicates, Sale's "persistent feeling of disquiet" has invaded the campus, an economic and intellectual enclave previously believed to be comparatively secure. With the institutional clamor for computerization in higher education, some professors worrying that, instead of cruising smoothly down the much-promoted "information superhighway," they will be tossed out the window like so much data trash. They also wonder if their students will be able to find employment and meaningful social relationships in the information society, or whether the human contact we base our social, cultural and pedagogical existence upon will soon be considered obsolete.

For critical communication scholars, the apprehension described here may hold a kind of discursive redemption. As our vulnerability makes the economic and social effects of information technology more personal to us and less academic than they used to be, we

may be more motivated to hold and teach a more critical view of technological development in a capitalist economy. We may actively resist serving the emergent communication industries as mere instructors of mechanization, preparing generations of young people for the de-skilled "data-entry, monitoring, and limited problem-solving" jobs Neill (1995) and others predict. Finally, we may urge our students to seek out and support those "decentralizing, globalizing, harmonizing, and empowering" aspects of the digitial age as heralded by Negroponte (1995, p. 229).

The computer is with us, and the social and cultural changes it is bringing into our lives - including the touted expansions of the information economy and the virtual classroom -have only begun to be felt. It is my hope that this paper and others like it will provoke timely discussion with our colleagues and students about humanistic and holistic applications of information technologies in contemporary life. Questioning the hidden costs of information technology in our own lives can enable a deeper dialogue on the structuring of a more humane global and national political economy. And as we teach our students to use and make sense of new communication media and messages, we can demonstrate the importance of an inclusive language that speaks to common problems and shared possibilities, not to the stratified class code of information elitism.

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